

Case Report

Midline Mandibulotomy in the Management of Chronic Bilateral Condylar Dislocation: A Case Report and Review of Literature

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Abstract

We present a case of long-standing condylar anterior dislocation treated with midline osteotomy of the mandible after multiple unsuccessful conservative approaches. Patient reported to us during COVID-19 pandemic with inability to close her mouth, happened after self-fall post epileptic attack. Hippocratic and Yurino's method of reduction were attempted and failed. Patient was then taken under general anaesthesia for indirect reduction which was unsuccessful again. A mandibular midline osteotomy was performed, hemi-mandibles were swung laterally to release the fibrous adhesions in the glenoid fossae and the condyles were seated back. The osteotomy site was fixed using miniplates and screws. Patient recovered uneventfully and no recurrence till date. The challenge in managing long-standing condylar dislocation is discussed in this case report with a brief review of literature.

Keywords: Condyle, COVID-19, Mandibulotomy, TMJ, Joint disease

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INTRODUCTION

Mandibular dislocation is defined as a non-reducing displacement of the mandibular condyle in front of and superior to the articular eminence, resulting in the inability to close the mouth. Dislocation causes stretching of the temporomandibular ligaments and spasm of the muscles of mastication leading to 'lock jaw'. Immediate manual reduction of the dislocation is the preferred method of treatment. Long standing TMJ dislocation is defined as an acute dislocation left untreated or inadequately treated for more than 72 hours [1]. These patients would require surgical reduction of condyle under sedation or general anaesthesia [2]. A wide variety of techniques for long-standing condylar reduction under general anaesthesia has been reported in literature varying from indirect traction methods to open surgical techniques. In long-standing dislocation, indirect traction methods are usually unsuccessful and would require open surgical methods to reduce the condyle. We present a case of a long standing bilateral condylar dislocation reduced using midline mandibular osteotomy, and the challenges of diagnosis and management is discussed with a brief review of literature.

CASE REPORT

A 20-year-old female patient presented to the department of oral and maxillofacial surgery with inability in closing her mouth for 3 months. Patient had an episode of epilepsy and loss of consciousness 3 months ago upon which her mandible got dislocated. She regained consciousness only after 3 days with neurosurgical intervention. Patient was unable to close her mouth after she gained consciousness. Manual reduction was attempted at the hospital, and it failed. Computed tomography of Brain performed after epileptic episode revealed an Arachnoid Cyst and showed dislocated condyle placed anterior to the glenoid fossa bilaterally. No further intervention was done to reduce condyle and patient was discharged. She reported to our department 3 months after this incident with dislocated mandible. Reason for late reporting as patient's parents mentioned was lockdown imposed due to the prevailing COVID-19 pandemic situation.

Extra oral examination showed elongation of lower half of face. Bilaterally, there was a depression in the pre-auricular area associated with severe tenderness. Masseter, Temporalis, Medial and Lateral pterygoid muscles were also found to have mild tenderness. Anterior open bite of 1.5cm was noted. Computed tomographic images of Face confirmed the diagnosis of Bilateral Anterior Condylar Dislocation. Additionally, an Orthopantomogram was advised on academic interest (Figure 1).

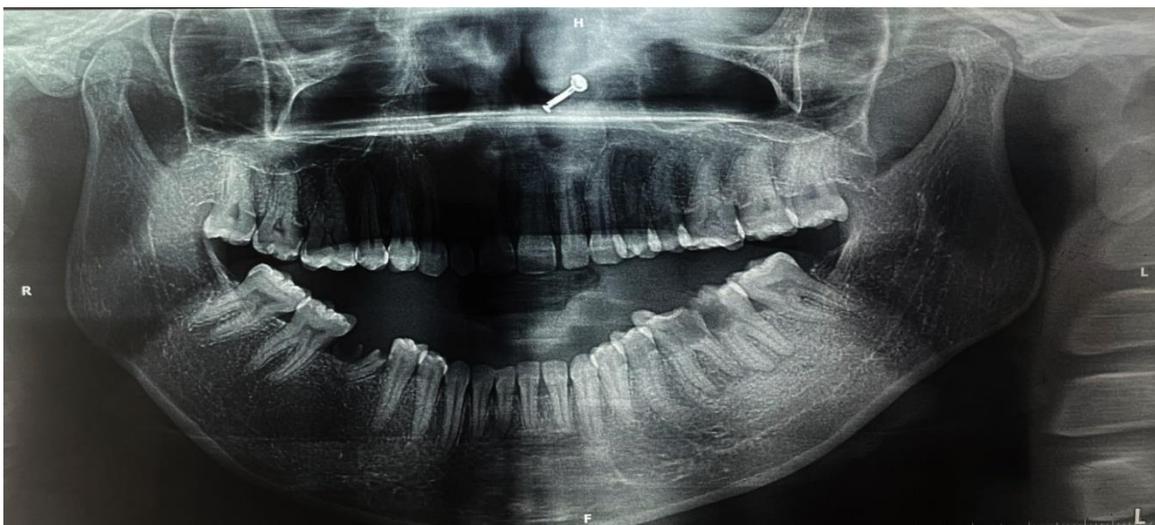


Figure 1: Pre-operative Digital Panoramic radiograph showing anterior dislocation of bilateral condyles.

Multiple failed attempts of manual reduction using Hippocratic and Yurino's methods were done under muscle relaxants, local anaesthesia, and sedation. Patient was taken under General Anaesthesia following the failure of these techniques. Conservative manual reduction was attempted again under general anaesthesia which was again a failure. Following which an indirect traction method was attempted. Bilateral angle of the mandible was exposed, trans osseous wires were passed through the bur holes made at the angle region and reduction was attempted through downward traction. This technique was also a failure. Further, bone hooks bilaterally in the sigmoid notch and downward traction was tried which again failed.

A midline mandibular osteotomy was performed after exposing symphysis region intra-orally, the hemimandibles were swung laterally to reduce the condyles to its original position in the glenoid fossa. The osteotomy was then fixed using four holed titanium miniplates after securing the intermaxillary fixation (Figure 2). The occlusion was maintained, and patient was placed on intermaxillary fixation using rigid elastics for a month with help of arch bars. The follow-up was uneventful with no relapse, mouth opening was satisfactory, and occlusion was maintained at the end of six months.



Figure 2: Post-operative Digital Panoramic radiograph showing condyles seated in glenoid fossae and fixation of midline osteotomy.

DISCUSSION

The condylar dislocation can occur in anterior-medial, superior, medial, and lateral directions. The dislocation of the condyle is common in anterior direction [3]. It is due to interruption of the normal chain of events which help in seating condyle back into the glenoid fossa post maximal mouth opening. The pathophysiology being the elevation of temporalis and masseter before the relaxation of lateral pterygoid leads to displacement of condyle beyond the articular eminence [4]. The structural abnormalities of disc, condyle, eminence, and ligaments are the common reasons inducing dislocation. The maximal mouth opening during yawning, laughing, vomiting, dental procedures, endotracheal intubation and epilepsy tend to cause dislocation. The predisposing factors are epilepsy, severe vomiting, Ehlers-Danlos syndrome, Marfan's syndrome. In our case, the patient had a fall due to an episode of epilepsy and the trauma which led to condylar dislocation. The

protracted dislocation was partially due to neglect from patient's side and also because of COVID-19 out-break which further delayed the treatment.

Management of condylar dislocation includes conservative techniques and surgical techniques where surgical is reserved for cases where conservative approaches fail. In long-standing dislocation, conservative techniques have high propensity of failure [5]. Reasons include masticatory muscle spasm, shortening and subsequent fibrosis of temporalis and pterygoid muscles, intra- and periarticular fibrosis, meniscal displacement, and pseudo ankylosis involving the zygomatic arch and the displaced coronoid process [2]. The Hippocrates method of manual reduction was attempted in our patient, but condyles could not be reduced due to spasm and fibrosis in the muscles of mastication.

There have been numerous efforts in the past to find sustainable alternatives for treating long standing dislocation of the condyle(s) since Jones reported a case of 1-year old long-standing dislocation in 1946 [6]. Later, a chronic dislocation treated with condylectomy was reported by Harpman in 1952 known to be the first surgical anterior reposition of condyles in treatment of dislocation [7]. The longest time span dislocation case, but unilateral was successfully treated by Rowe and Killey in 1970 using the same technique of condylectomy [8].

The aim of surgical intervention of long-standing TMJ dislocation should be (1) complete reduction, (2) restoration of adequate jaw movement, (3) minimal morbidity to intra- and periarticular tissue, and (4) minimizing the chance of recurrence [2]. There are situations where even after seating the condyles back into the fossa, occlusion may not be satisfactory due to fibrous tissue growth in the fossa. Failed attempts of traditional manual reduction methods can be approached by placing a small incision at the mandibular angle region, drilling a hole and apply traction using a wire or a bone hook engaging the drill hole [6]. If this attempt fails too, Fink method, indirect surgical reduction technique using bone hooks in sigmoid notch along with traction wires through the angle of the mandible can be tried (Hammersley 1986) [9]. We applied this technique by simultaneous use of bone hooks in the sigmoid notch and trans osseous wires in the angle region help which only helped in partial reduction. The failure of completely reposition of condyles is attributed to muscle contraction, a sequelae of inter-positioning adjacent tissues, meniscal wedging, exuberant and irregular or specular callus and fibrous adhesions, with nearthrosis or even due to fibrous ankylosis between the capsule and articular eminence [10].

Direct surgical techniques for reduction are inevitable in cases of inability to achieve complete condylar repositioning which includes condylotomy, condylectomy, inverted L-shaped osteotomy, oblique bilateral osteotomy and bilateral sagittal split osteotomy [11]. Although these methods are promising but, all are invasive and technique sensitive. Alternatively, a less invasive and relatively easy technique of midline mandibular osteotomy was introduced by Lee et al in 2006 [11]. The midline mandibulotomy eliminates the complications of direct TMJ approach such as facial scar, facial nerve injury, sialocele, Frey's syndrome etc. Lee performed a single straight osteotomy at the symphysis region and swung the hemimandibles laterally and seated the condyles in glenoid fossa. Rattan et al modified Lee's Midline osteotomy by performing a stepwise osteotomy instead of straight [2]. Satnam Singh Jolly and colleagues reported a case of effective reduction of a case of posteriorly displaced condyles using midline osteotomy in 2020 [12]. Along with seating the condyles in the fossae, it is also important to remove the fibrous adhesions in the fossa which has formed due to long-standing dislocation, to maintain the occlusion post-operatively. Adequate mobilization of the hemi-mandibles will help to achieve this. Complete reduction of condyles was achieved in our patient after midline osteotomy. If the reduction is inadequate or if the occlusion is not maintained even after midline osteotomy, open TMJ surgery should be performed to achieve optimal results.

CONCLUSION

The procedures on articular eminence have been gaining popularity off late but they do not address the actual structural deformities in the disc, condyle, and ligaments. Moreover, these procedures are invasive and can also lead to morbidity because of injury to facial nerve. Hence a less invasive procedure like Midline mandibulotomy should be attempted before the surgical procedures of meniscus and condyle.

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